

**ANALYSIS OF PSSDB WALL PANEL  
WITH VERTICAL BUTT JOINTS  
IN THE DRYBOARDS**

By

**HERSAIFUL HERWAN BIN BAHARUDDIN**

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I think if any of us honestly reflects on who we are, how we got here, what we think we might do well, and so forth, we discover a debt to others that spans written history. The work of some unknown person makes our lives easier everyday. I believe it's appropriate to acknowledge all of these unknown persons; but it is also necessary to acknowledge those people we know have directly shaped our lives and our work.

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They are:

**Mr. Goh Ching Hua**

*(Lecturer/Supervisor, Faculty of Civil Engineering)*

**Assoc. Prof. Ir. Siti Hawa Binti Hamzah**

*(Lecturer, Faculty of Civil Engineering)*

**Pn. Hj. Juraidah Binti Ahmad**

*(Lecturer, Faculty of Civil Engineering)*

## ABSTRACT

Composite engineering component which may consist of two or more materials, connected or combined to give a performance in services, which is superior to the properties of its individual materials.

Profiled steel sheet dry board (PSSDB) is a composite system, which classified into macro composite system comprises of profiled steel sheet, cemboard and connected by self-tapping screw. This system when combined imposed strength and stiffness.

The proposed of this system as a load-bearing wall give more advantages in building construction. It's a lightweight structure, easy to fabricate and save a lot of time for installation work.

In this thesis research, Profile Steel Sheet Dry Board has been treated as load-bearing wall, where it's due to window opening using finite element method (LUSAS) has been analyzed. The model analyzed measures 1200 mm wide and 1000 mm high. A window opening of 400 mm by 400 mm is modeled as symmetrical position.

LUSAS 13.5 software adopted to create the finite element model. The model was modeling using 3D thin shell elements as a profiled steel sheet (Bondek II) and dry board (Cemboard).

A series of load had been assign to this model and the result are stated as follow; for load 256 kN/m the maximum displacement is 2.838 mm, for maximum stress is - 541.5 N/mm<sup>2</sup> and for the maximum strain is 0.0071.

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## CHAPTER I

### INTRODUCTION

#### 1.1 An Overview

The Profiled Steel Sheet Dry Board (PSSDB) system is an innovation firstly introduced by Wright and Evans in the United Kingdom in 1986 (Wright et al. 1989). The system has been developed from various research project conducted initially at the University of Cardiff and Strathclyde, United Kingdom. At present, further research work and extension of the earlier works are conducted extensively at Universiti Kebangsaan Malaysia. The PSSDB panel system is a kind of composite structure.

The idea comes from work experiences on composite flooring using profiled steel sheeting and concrete. The difference here is that a wood panel product substitutes for the in-situ concrete slab. This makes the structure lighter and easy to construct and assemble on site. The system consist of profiled steel sheeting connected compositely to dry board with self-drilling screws to produce individual panels. It has been shown from previous studies that the behavior of the PSSDB panel was proven efficient under the conditions related to bending, axial, as well as the combination of both bending and axial loads. The PSSDB system is lightweight, can be constructed in a short period of time, does not require skilled worker to construct, and can be transported easily. This is why the system is practical and alternative